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ABSTRACT

The results of a project to determine how English polytechnic lecturers see their teaching objectives are presented. Development of a behaviorally referenced student feedback questionnaire and the theory behind behavioral referencing are described. The definitions of teaching and learning are explored and the relationship between teaching and relevant learning is examined. A list of 46 behavioral objectives was selected and 81 academic staff from 12 institutions working the areas of humanities, education, arts and design, social studies, business studies, engineering, and science rated the importance of each objective on a five-point scale. Findings show that (1) 24 of the objectives were rated as of major importance on either a majority or consensus basis by at least one discipline area, (2) only one objective (develop ability to work unsupervised) was chosen by every discipline area, and (3) that the choice of major objectives was very strongly discipline-specific. A discussion of the patterns of choice by the different disciplines demonstrates that the pattern is specific for each of the discipline areas and often clusters in either the cognitive, affective, or psychomotor domain. This pattern, it is explained, is not arbitrary, but rooted in the disciplinary culture. (PHR)

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How Lecturers See Their Teaching Objectives

C.C. de Winter Hebron *

I

TO THE EDUCATIONAL RESOURCES
INFORMATION CENTER (ERIC)."

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The results described in this article were obtained as part of a project which has been going on for the last three years for the production of a behaviourally referenced student feedback questionnaire for general use in helping lecturers diagnose their own strengths and weaknesses as teachers. The chain of reasoning that led me to prefer the behaviourally referenced form of such a questionnaire, out of the various forms available, as well as my reasons for objecting to the main present exponent of that form - the American 'IDEA' questionnaire - have been described in detail already elsewhere ('AID - A Teaching Consultancy Backup Service for English Polytechnics', paper to EARDHE Congress, Klagenfurt, January 1979, to be published in 'Higher Education A Field of Study' ed. E.A. van Trotsenburg, Peter Lang, Vienna, Oct. 1979) and need not therefore be repeated here. However, in order fully to appreciate some of the findings that follow it is necessary to understand the basic theory behind behavioural referencing and this is described briefly in the rest of this initial section.

'Teaching', as an activity having some effect upon students, can best be described as 'those things teachers do' (not only what they do, but also how). Some of the things teachers do - an example so extreme as to be silly would be 'breathing' - are general - things teachers do not as teachers but just as human beings - and so can be ignored for our special purposes. Other things - again, an extreme example would be 'periodically sticking your finger in your left ear' - are highly individual, perhaps even eccentric: they may indeed have some sort of effect upon students, but it's not one about which student questionnaires can give us any useful information. In between these extremes, however, lie a range of activities - for example, 'asking questions framed in a certain way' - which clearly are common to many teachers, and also clearly are specific to teaching, rather than other kinds of human activity. We can ask students for example, which of these activities their teachers perform, and how often, and expect to get a sensible answer.

'Learning' is the student activity we normally associate with teaching (their exact relationship is rather complex, and I'll discuss it in a moment). This in turn can be defined as 'acquiring information, or attitudes, or abilities or skills, which the student didn't have before'. The abilities or skills show themselves in new activities, new behaviour; the attitudes show themselves in new choices of behaviour. How the acquisition of new information per se shows itself, as distinct from acquiring new attitudes or abilities along with it, it is rather more complex to determine: however, in higher education, as we shall see, most teachers don't rank acquiring mere facts as very important. Again, many things that are learnt while one is a student are not particularly linked with the teaching one receives: one may, for instance, learn about kinds of wine, or learn how to make love, during this period of one's life. We shall not, therefore, be interested in all the student's learning, but only in that which has some relation to the teaching he or she has received. We can determine which this is, at least in a limiting sense, by examining the objectives at which the teacher is aiming in his teaching: there may be other learning by the student which doesn't relate to these objectives but is nevertheless linked to the teaching he has received, but this, as far as the teacher is concerned is an unintended by-product of his teaching. Ideally, we'd like - and so probably would he - to find it out, but unless it actively interferes with students reaching one of his stated objectives, it is not essential to him that we do so.

But what is the relationship between teaching and the relevant learning? Of one thing we can be quite sure; teaching doesn't cause learning* - too many students have learnt without a teacher, and too many failed to learn with one, for that to be true. The best

* Johnson, Rhodes & Rumery: The Evaluation of Teaching - A Retrospect and a Prospect. I. Higher Education IV, 1976.

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we can say, probably, is that some teaching helps students to learn, and that the more it does this, the better it is. But - again - how can we know when we're helping student to learn? Because there's no direct causal link, and for other reasons too, students' results tell us this only in a very limited sense - silly answers on exam papers tell us that sillinesses have been learnt, and what sort of sillinesses they are, but not precisely how or why; comparatively poor performances, if the same students are involved as in the better performances, tell us where these students have been performing below capacity, but again not precisely how or why this has happened; and the reverse situations - good answers by students - are limited in the same ways too. Besides, by the time of the exams, it's too late for us to do anything that will help that student generation. We need something that will help us find this out earlier.

One thing that does seem to indicate when students are being helped to learn is their own sense of confidence in their progress. It may be, of course, that 'objectively' - as measured by the exam results - this will be to some extent misplaced; the student may in fact be making rather more, or rather less, progress on the course than he or she thinks. This however doesn't actually matter to us for this purpose: the crucial point is, not only that a student confident in his or her own progress is liable to learn as well as other factors - personal temperament or ability, for instance - will allow, but especially that one whose confidence is crippled, won't. Studies conducted in USA by the Centre for Evaluation and Development in Higher Education suggest that far more damage is done by undermining students' confidence in their own progress than by making them over-confident*. (By 'progress' here, of course, we must mean 'progress towards the relevant objectives')

So, students can observe what their teachers do, and can tell us about their own confidence in their progress. But why ask them to do it in that difficult and - in UK academic circles anyway - sensitive way, through a student feedback questionnaire? The first thing to be said, is that there's no suggestion that this should ever be the only sort of student feedback involved: indeed, I have argued in a previous paper ('Cooperating with students over Course Assessment', Proceedings of 2nd IUT Conference, Heidelberg, July 1976) that student questionnaires should only ever be used within a context of individual and group discussions between the students and staff engaged on a given course - which means, of course, that they must always be the concern of the individual or course team, with technical consultancy from academic specialists where and if necessary, and never, never the concern of the college administration. Within that context however, questionnaires and such like devices have the important use that they enable us to discriminate in a measurable way between individual preferences, prejudices or what have you and things that are true overall (either objective facts or beliefs and preferences that are generally held). In the present case, there is considerable research evidence from USA to suggest that the frequencies with which teachers are seen by students as doing particular things (not 'how well', which is begging the question altogether) correlate with the extent to which students are confident of their progress towards particular objectives. In tests, where teachers used student rating of their behaviour, correlated in this way, as information on which to base specific new teaching strategies, measures of student confidence in their progress increased on retest as predicted*..

II

'This is a long preamble of a tale', but what follows should show its relevance. Clearly, for the system I have described above to work, we must have located the right activities by teachers to ask students about, and we must have located the right set of objectives - those that are meaningful to students and teachers alike, but especially those that are important to the teachers. The 'IDEA' questionnaire initially included a group of twenty such objectives (reduced to ten in later versions) which it used with teachers and students of all disciplines alike: these had been derived by Thurlstone techniques, with a jury of experts selecting those objectives which would be generally valid in this way.

This intrigued me. I found it difficult to see how such a jury of experts could be

* for evidence on both those points, see D.P. Hoyt: A Preliminary Evaluation of Faculty Development Services at Kansas State University, KSU Office of Educational Research

constructed - who could serve on it. I also found it difficult to believe, as a result of talking over many years to many lecturers in different disciplines that, in UK at least, there would be such a general list. It therefore became very important to test this point, and this was done as follows:

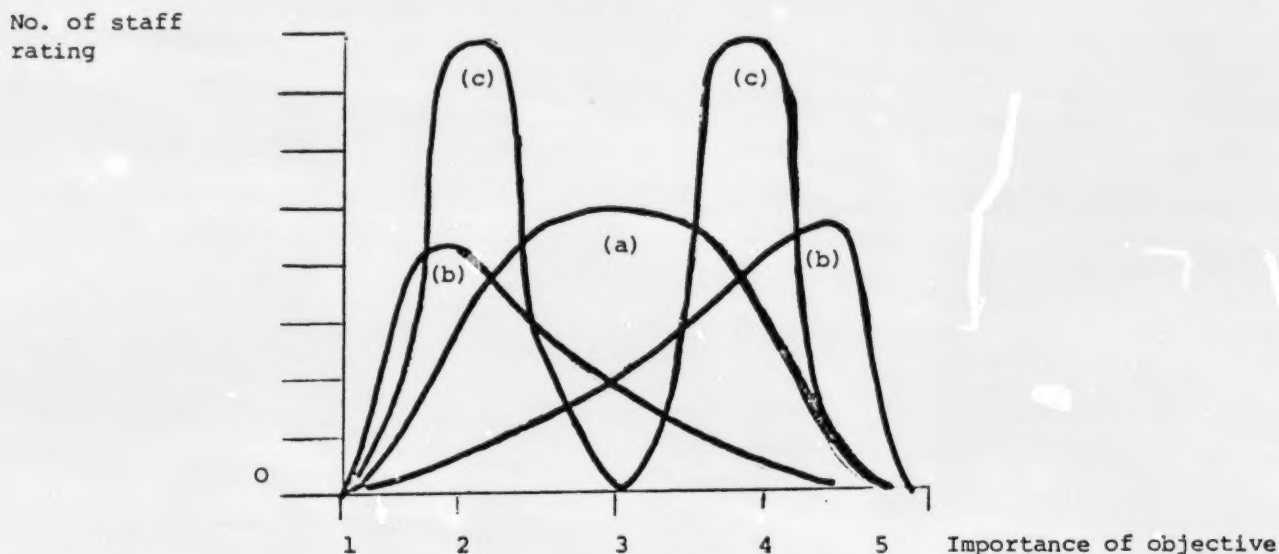
A list of 46 behavioural sentences, corresponding to Whitlow's reduction of Bloom and Krathwohl's taxonomy for all three domains (Cognitive, Affective and Psychomotor) was rated for importance on a 5-point scale by a sample of 81 academic staff from 12 institutions, working in seven "discipline - areas" - Humanities, Education, Arts & Design, Social Studies, Business Studies, Engineering and Science. (The full list of sentences is reproduced at the end of this article.) The results for each item were then analysed for skewness, both for the whole group and for each discipline-area.

On the skewness analysis, three types of result were observed (Fig.1).

- (a) a normal curve (skewness $< \pm 0.6$)
- (b) a skewed curve
- (c) a curve normal about its mean, but possessing high kurtosis and with the mean substantially removed from the mid-point of the scale.

Types (b) and (c) could be skewed or shifted up or down the scale. In interpretation, type (b) was read as indicating a situation where all ranges of opinion about the importance of that objective were present, but there was a "majority" view that the objective was important (or unimportant), and type (c) as indicating a situation where there was a substantial "consensus" view about the objective's importance. Type (a) was taken as indicating a neutral majority.

FIGURE 1 : TYPES OF RESULT



Of the 46 behavioural sentences, 24 were found to be rated as of major importance on either a 'majority' or a 'consensus' basis by at least one discipline-area, 22 ranging across the three domains and the other two being 'instrumental' objectives related to the sort of use the lecturer hoped the student would make of the skills etc., learnt. The arrangement of these by discipline-area is shown in Table 1 below (a tick indicates 'of major importance')

TABLE 1 : 24 'MOST IMPORTANT' OBJECTIVES, BY DISCIPLINE

Objective	HUM	EDN	ART	SOC. & STDS	BUS. STDS	ENG'G	SCIENCE
			DES				
<u>COGNITIVE DOMAIN</u>							
1. Recall facts					/		
2. Recall principles	/				/	/	/
4. Interpret data	/	/		/	/	/	/
5. Extrapolate material	/	/	/	/	/		
6. Apply data to solve problems				/		/	/
7. Analyse for relationships							/
9. Be aware how professional scholars acquire new knowledge	/						
10. Synthesise material to provide structured paper				/			
<u>AFFECTIVE DOMAIN</u>							
17. Be sensitive to human problems	/	/		/			
23. Contribute to group activity	/	/					
24. Evaluate rules & conventions							/
25. Accept responsibility	/		/	/			
26. Enjoy the work	/		/	/		/	/
27. Appreciate subject values		/	/	/			
28. Organise own value-structure		/	/				
29. Be aware of own limitations			/		/	/	
30. Develop ability to work unsupervised	/	/	/	/	/	/	/
31. Develop creative capacities			/		/		
<u>PSYCHOMOTOR DOMAIN</u>							
35. Assemble apparatus			/			/	
36. Want to be careful/skillful in practice		/					/
39. Express himself clearly	/	/	/		/	/	
44. Cope with totally unexpected		/	/				
<u>'INSTRUMENTAL' OBJECTIVES</u>							
45. Develop repertoire of professional skills		/	/	/	/	/	/
46. Discover implications of subject for self-understanding		/	/		/		
TOTAL RATED	10	12	13	10	10	9	9

A number of interesting features can be observed from this table. First, no discipline-areas came anywhere near rating the whole 24 objectives as of major importance, and most rated less than half. Second, the choice of major objectives was very strongly discipline-specific. The choice patterns of 8 of the objectives (No. 2, 10, 17, 24, 27, 35, 44 and 45) were statistically related to chooser discipline, and it is also worth noting that:

- (i) only one objective (No. 30) was chosen by every discipline area
- (ii) only two other objectives (Nos. 4 and 45) were chosen by every area but one
- (iii) only four other objectives (Nos. 2, 5, 26 and 39) were chosen by a majority of areas

Thus, 17 of the objectives were chosen by fewer than half the areas, and for any one area the number of such objectives ranged from 33% (engineering) to 60% (Art & Design) of the total choice. It is therefore clear that, in U.K. anyway, the assumption about objectives at the basis of the 'IDEA' design is simply not valid. Which objectives lecturers choose, and how important they perceive them as being, is on this account very much a matter of which discipline area they belong to: any British questionnaire of the sort I have described above, therefore, will need to have separate versions for use within the different disciplines at least as far as the list of objectives is concerned. (Whether this will hold true also for student perceptions of 'the things lecturers do' is still being tested.)

This, while it will make the job of statistical analysis a trifle harder, will also have an advantage: it will anchor the use of the questionnaire firmly within the discipline and thus in the domain of academic expertise and staff-student conversation within departments and course teams. There simply won't be a valid version of this questionnaire available for College administrations to take up and use in some blanket fashion.

III

But what, if anything, do these different patterns of choice by the different disciplines mean? To try to understand this, we need to look first at the pattern of distribution across the different domains of the 24 most important objectives. Clearly, that pattern forms a characteristic discipline signature - strongly affective for Art & Design, more weakly affective for Education; strongly cognitive for Business Studies and for Science; balanced between the two for Humanities, Social Studies and Engineering, though with a different selection to form that balance in each case. Also clearly, that signature varies in what I may describe as 'enthusiasm' over assigning importance to objectives, both in the number chosen as important, and in the extent to which that choice involves departures from the norm (see Fig. 1 above). This can be expressed mathematically as a modified form of the mean skewness for those 24 objectives, ignoring sign; the modification, needed to cope with the depressant effect on this calculation of cases of 'consensus' choice, consists of substituting for the actual skewness for such cases an assumed skewness related to the median, viz 1.0 where the median is 4, and 3.0 where the median is 5; where the median is less than 4, the actual skewness is retained. The ratings for 'enthusiasm' so obtained are shown in Table 2.

Table 2: Enthusiasm Ratings, by Discipline

<u>Discipline</u>	<u>Rating</u>	<u>Number*</u>	<u>Discipline</u>	<u>Rating</u>	<u>Number*</u>
Humanities	0.9182	10	Bus. & Profnl	0.9223	10
Education	1.0196	12	Engineering	0.7610	9
Art & Design	1.3222	13	Science	0.6678	9
Soc.Stds.	0.8227	10	(Overall rating	0.8664)	-

* Number of objectives chosen as major importance out of the 24 - see Table 1.

It will be seen that the value of the rating increases in step with the number of objectives chosen. Looked at in this way, we have three distinct kinds of discipline here:- Engineering and Science at the one extreme are concise in their number of choices, and don't readily depart from the mean in their ratings; Education and Art & Design, at the other, enthusiastically choose a much larger group of objectives as all being of importance and equally enthusiastically rate up the scale on many of them; while the other three disciplines fall in between the two, around the overall norm for enthusiasm. This difference, again, I suspect is quite characteristic of the way staff in those disciplines tend to approach their teaching - or even perhaps life in general. We get different results because we are dealing in effect with different cultures.

This notion is still more borne out if we look, not just at the 24 most important objectives, but at all of them. By plotting their modified skewness values (this time with sign) against domain, a matrix can be obtained which in effect gives us a cultural profile for each discipline. In the examples given here, limitations of space mean that I can only show the number of each objective concerned, and I must ask the reader to use the list of objectives at the end of this article as a key; working versions of these profiles are however normally constructed with the behavioural sentences actually in position, and can then be read as a self-explanatory chart. Inspection of them can tell us a great deal about the characteristics of each discipline; for instance, it can pinpoint those elements that may cause most difficulty (cognitive or affective dissonance to a student entering it from another disciplinary background. In the context of recurrent education, this information can be very important to course design.

The tables that follow (Tables 3 a - g) give the short forms of these profiles; the article will then end with some examples of the sorts of insight which can be derived from this technique. 'Major' importance or unimportance indicates a modified skewness greater than ± 1.0 ; 'Neutral' indicates a skewness less than ± 0.6 .

TABLE 3: DISCIPLINARY PROFILES, IN SUMMARY

Discipline & Domain	Important		Neutral	Unimportant	
	Major	Minor		~~Major~~ Minor	~~Minor~~ Major
A) HUMANITIES: Cog.	2,4,5,9	6,10,14	1,3,7,8, 11,12,13		
Aff.	17,23,25, 26,30	18,20,22, 27,28	15,16,19,21, 24,29,31	32	
Psych.	39		36		33,34,35,37,38, 40,41,42,43,44.
'Instrumental'		45	46		
B) EDUCATION: Cog.	4,5	2,3,6,7, 10,12,13	1,8,9,11,14 15,16,18,19		
Aff.	17,23,27, 28,30	7,24,26, 29,31	20,21,25,32 33,34,35,37,38		
Psych.	36,39,44		40,41,42,43		
'Inst.'	45,46				
C) ART & DES: Cog.	5,12,13,14 15,18,20, 25,26	2,6,7, 8,9,11	1,3,4,10		
Aff.	27,28,29, 30,31	17,22,33,24	16,19,21,32		
Psych.	35,38,39 40,12,44	36,43	33,34,37	41	
'Inst.'	45,46				
D) SOC. STDS. Cog.	4,5,6,10	7,8,13	1,2,3,9, 11,12,14		
Aff.	17,25,26, 27,30	18,20	15,16,19,21,22, 23,24,28,29,31,32		
Psych.		39	36,37,38,42,44	35	33,34,40,41,43
'Inst.'	45	46			
E) BUS. STDS. Cog.	1,2,4,5,	8,10,13	3,6,7,9 11,12,14		
Aff.	29,30,31	19,20,25,26	16,17,19,22 23,24,27,28	21,32	15
Psych.	39	36,42	37,38,41,44		33,34,35,40,43
'Inst.'	45,46				
F) ENG'G. Cog.	2,4,6		1,3,5,7,8,9 10,11,12,13,14		
Aff.	26,29,30	20,23,27	16,17,19,22 24,25,31,32		15,18,21,28
Psych.	25,39	34	33,36,37,38 40,42,43,44		41
'Inst.'	45	46			
G) SCIENCE Cog.	2,4,6,7	5,8	1,3,10,11 12,13,14	9	
Aff.	24,26,30	16,18	15,19,20,22,25 27,28,29,31	17	21,23,32
Psych.	36	35,38,39	34,37,40 42,43,44	33,41	
'Inst.'	45		46		

Table 4: The Full List of 46 Objectives

By the end of my teaching with him (her) the student should be able to.....

1. Recall specific facts (terminology, classifications, methods, trends etc).
2. Recall fundamental principles, generalisations or theories (laws, rules, systems, concepts, etc.)
3. Translate data and material from one form into another (express in alternative form) (includes being able to make effective notes of material).
4. Interpret, explain or summarise material.
5. Extrapolate material (extend meaning, predict consequences, trends, effects, etc.).
6. Apply course material to solve problems in the subject area.
7. Analyse data and material (identify elements or relationships.)
8. Analyse material (identify organisational principles and structures).
9. Be aware of the methods by which professionals in this subject area go about acquiring new knowledge.
10. Synthesise material to produce a structured essay, report or seminar paper.
11. Plan an operational procedure, experimental design, research proposal, etc.
12. Produce a new set of abstract relationships from material (generalise).
13. Judge and evaluate subject material against given criteria.
14. Generate criteria for judging material in the subject area.
15. Be aware of aesthetic factors in the subject material.
16. Attend closely to explanations in the subject area.
17. Show sensitivity to human needs and social problems.
18. Discuss, or respond to questions on, course material.
19. Comply with rules, conventions etc.
20. Work hard at the material in the subject area.
21. Volunteer for tasks, optional work etc.
22. Cooperate with others (relate to them, interact with them).
23. Contribute to group activities (e.g. promote discussion of course material).
24. Evaluate rules, conventions etc.
25. Accept responsibility for actions (his own or others').
26. Enjoy the work, and respond to it (show interest in it).
27. Appreciate or value values implicit or explicit in the subject area (examples might be - appreciate artistic merit, believe in the democratic process, be aware of and value scientific method, show concern for others' problems, etc., etc.)
28. Organise a value structure for himself (or for the subject).
29. Be aware of his (her) own limitations and deficiencies.
30. Develop ability to work unsupervised.
31. Develop creative capacities.
32. Demonstrate consistent ethical principles and social ideals.
33. Perceive and interpret physical stimuli relevant to the subject area (e.g. in chemistry taste or smell of certain substances, etc.)
34. Recognise apparatus, tools, chemicals, etc. as appropriate.
35. Assemble and set up apparatus, read instruments etc.
36. Want to be accurate, careful, skillful in practical work.
37. Follow instructions under supervision (repeat procedure demonstrated).
38. Make use of trial and error.
39. Express himself (herself) clearly and in a controlled way in speech, writing, music, drawing etc, as relevant.
40. Exhibit manual skills (use tools, instruments, machines etc. properly).
41. Reproduce predetermined standards of physical performance.
42. React correctly to faults, errors, unexpected events.
43. Co-ordinate motor skills or motor and cognitive skills (example - drive a car well, perform fine operations with dexterity).
44. Deal with totally unexpected events, emergencies, potential dangers.
45. Develop the repertoire of skills and attitudes recognised as appropriate for professionals in the real-life field work most closely related to the subject area of study.
46. Discover the implications of course material for self-understanding.

What do these profiles suggest to us? In Humanities, we may notice the way in which the cognitive objectives selected tend more towards the conventional 'scholarly virtues' than in, say Engineering or Business Studies: the importance of affective objectives, and the selection of those in particular that make for inner direction and subject commitment; the unimportance of 'real life' psychomotor skills (33, 36, 40-44) and the comparatively low status accorded to the two instrumental objectives: the culture being communicated by this selection of objectives is indeed firmly that of 'knowledge for its own sake'. Education is somewhat similar, but much more 'enthusiastic', and, it seems, its members are quite unable to select any possible teaching objective as actually unimportant; in the cognitive domain, the selection of objectives is interpretive but not scholarly (low values on 11 and 14); in the affective domain, it is inner directed, but not subject-centred or rigorous (low values on 18, 20 and 25): Humanities students, going on to an 'education year' might well, one suspects, find the varied claims for some level of importance (a third as many again as in their own discipline) potentially incompatible, and the disciplinary culture enthusiastically non-rigorous - and indeed one knows from discussions with students and staff that some attitude very like this often is actually the case. Art and Design is even more 'enthusiastic', but there is a different pattern to its enthusiasm and one that is much less internally incompatible; its preferred cognitive skills are mainly evaluative (12, 13, 14), quite different from the other disciplines; its affective and psychomotor skills strongly stress a craftsmanlike emotional engagement with, and hard work in, the chosen field: overall, it certainly is very different in pattern from the other disciplines, and one can readily understand from this how the Art faculties in some institutions can tend to become culturally separate entities, incomprehensible to those outside. Art and Design and Education also both show up as disciplines placing a great value on objectives that further student co-operation (22,23).

Another group of disciplines - Social Studies, Business Studies, Science - by contrast tend to be more directed to 'loners' (though in the case of Business Studies this is perhaps a little surprising). In other respects however they - and Engineering, which resembles Science in a number of ways, though not in that* - can be very different. My final example considers what we may infer from these profiles about the problems of someone trained in Engineering returning to study, let us say, Management - a problem faced in a number of graduate Business Schools. First, we have to point out that the profile for Business Studies (which includes Management) is much less 'black and white' than that for Engineering; there are more degrees of importance/unimportance involved, and more items in them: that itself might cause problems of adjustment and preparedness. Second, we notice the way the Business Studies profile upgrades affective skills, and downgrades some psychomotor skills - expected enough, to us, but to an incoming student from Engineering, quite possibly evidence that these Management types are both 'fancy' and 'snobby', (confirming all his prejudices!). Finally, we notice specific changes in the rating of various objectives, all of which are liable to give him trouble - changes towards things he hasn't previously learnt to value - analysis, evaluation and re-synthesis of material (8,10, 13), being creative, taking responsibility and reacting to the unexpected (28, 31, 42). It may well be that all good real-life engineers do this anyway, but that's not the cultural picture communicated by his teachers in selecting their objectives: and this sort of cultural strain may do much to account for the difficulties in returning to study observable in this kind of student.

Finally, the thing to be noted about these profiles is the kind of sense they all make. We can see why they are as they are. The differences between selection of objectives, by different discipline is not arbitrary: it is rooted in the disciplinary culture.

* Science and Engineering also differ in several fascinating details - particularly the different degrees of importance they attach to hard precise and careful thinking and argument (7, 18, 24, 36) and to being aware of one's own limitations (29).